CLAIMS

1. An improved pump drive head (1) having an integrated stuffing box (9, 60) and comprising: a power transmission (3, 4) coupled to the rotating pump driveshaft (8) within a crude oil well; a stuffing box (9, 60) to retain the pressure; a thrust assembly (6) adapted to take the tensile force exerted on said pump shaft; characterized in that said power transmission comprises a tube (5, 16; 62, 61) arranged to be rotated coaxially with the shaft (8) and having at least two different diameters; that the rotary seals (20; 50) fit over the small outside diameter of the tube to establish fluid-tightness between said tube and the body (19, 73) of the stuffing box, the outside diameter (51) of the seals (20; 50) being smaller than the large outside diameter of said tube (5, 16; 62, 61); that the tube-to-shaft fit incorporates static seals (17, 64); and that the static ones (17, 64) and rotary ones (20; 50) of the seals are adapted, by virtue of a retainer ring (22, 78) provided, to come away along with said tube and the component parts associated with the seals inside said stuffing box (9, 60).

2. An improved head according to Claim 1 above, characterized in that the tube (5, 62), being rotated coaxially with the shaft, is connected with its bottom end axially to a sleeve (16, 61) for rotation therewith and jointly defining said large and small diameters, the small diameter locating inside the stuffing box (9, 60) and the tube and sleeve, once connected together, forming a unitary piece.

3. An improved head according to either Claim 1 or 2, characterized in that a rotary gasket (24) is provided on the bottom end (21) of said tube/sleeve (5, 16) for rotation therewith, the outside diameter of the gasket being a labyrinth pattern (25).

4. An improved head according to one of Claims 1, 2 and 3 above, characterized in that said gasket (24) is connected to the retainer ring (22) of the seals (20; 50) on said tube/sleeve (5, 16) of the stuffing box (9).

5. An improved head according to one of the preceding claims, characterized in that an outside-communicated tapping hole (26) is

provided downstream of the gasket (24) and/or the respective oil seals (20) in the direction of the pressurized flow from the well.

6. An improved head according to one of the preceding claims, characterized in that, when the rotary seals are packing seals (50), an oil seal (55, 88) is provided downstream of the rotary seals and of the inlet hole (58, 75) for the liquid lubricant to the packing, the packing being mounted between said tube/rotating sleeve (5, 16; 62, 61) and the inner seat (51) of the stuffing box (9, 60).

7. An improved head according to one of the preceding claims, characterized in that the packing (50) is mounted on said rotating sleeve (16) through at least one detent ring (52) and a pre-load spring (53) between the packing and said retainer ring (22).

8. An improved head according to one of Claims 1 to 6, characterized in that the packing (50) is mounted around the small diameter of said tube/rotating sleeve (61) and is held there by at least one axial retainer ring (79) and a pre-load spring (83) placed between the packing and the axial thrust assembly (18).

9. An improved head according to one of Claims 2 to 7, characterized in that the static seals (17) are placed for reduced radial bulk in the joint region between said tube (5) and said sleeve (16), and are compressed there to make a tight seal as said tube and sleeve are made fast together.

10. An improved head according to one of Claims 1 to 8, characterized in that the static seals (64) are placed for convenient replacement in the joint region between said tube (62) and the shaft (8), and make a tight fit within the skirt (63) of the top cover (28).

11. An improved head according to one of the preceding claims, characterized in that said tube (5, 62) is connected to the thrust assembly (6) for rotation therewith by a rotating hub (27) held in place by a guiding tighten-down means.

12. An improved head according to Claim 11 above, characterized in that said guiding tighten-down means comprises a rolling thrust bearing (31) and a bell (30) enclosing said hub (27) and said thrust bearing.

13. An improved head according to Claim 11 above, characterized in that said guiding tighten-down means comprises a rolling thrust bearing (31) disposed in the upper portion (70) of the drive housing (12) and a bell (71) covering said hub (27) and thrust bearing.

14. An improved head according to Claim 11 above, characterized in that said hub is formed on its inside diameter with an axial slot (34) for pulling out the connection tongue (13) between said tube (5) and the drive.

15. An improved head according to one of Claims 6 and 8 to 10, characterized in that the packing pre-loading spring (83) in the stuffing box is disposed inside a split casing (81, 82) to prevent overloading the spring when in the compressed state.

16. An improved head according to Claim 8, characterized in that a ring spacer (54, 84) is provided in the stuffing box which is bored for communication with the liquid lubricant inlet hole (58, 75).

17. An improved head according to Claim 16 preceding, characterized in that said bored ring spacer (84) is formed with an annular seat (85) for a lip-type oil seal (86) arranged to contact the diameter of said tube/sleeve (61)

18. An improved head according to Claim 16 above, characterized in that said bored ring spacer (84) is formed with an axial middle ledge (87) for insertion past the lip of an adjacent ring seal (88).

19. An improved head according to one of Claims 1 to 3, characterized in that a gasket (76) carrying a labyrinth pattern (77) on its inside diameter is keyed to the bottom end of the sleeve (61) for rotation therewith.

20. An improved head according to one of the preceding claims, characterized in that a shaft locking clamp (10), placed within the body (19) of the stuffing box (9), comprises a jaw pair (35, 36), one (35) pulls and one (36) pushes, operated through a screw (38) arranged to act with its end on one jaw (35) and engaged in a threaded hole formed in the other jaw (36).

21. An improved head according to Claim 20 above, characterized in that said push and pull jaws (35, 36) are operated through a

screw (38) arranged to act with its end on the push jaw (35) and engaged in the threaded hole formed in the pull jaw (36).

22. An improved head according to Claims 20 and 21 above, characterized in that the stem (40) of the screw (38) is cylindrical and fits through a seal (39) on the cover (42).

23. An improved head according to Claims 20, 21 and 22 above, characterized in that guide and elastic bias members (43,44) are provided between the pull jaw (35) and the cover (42).

24. An improved head according to one of Claims 1 to 19, characterized in that a clamp (65) with self-centering jaws (66) is associated with the body (73) of the stuffing box (60), the jaws gripping the shaft in a wedge contact (68) relationship of the outer surfaces of the jaws to the inner surface of the sliding body (69) of the clamp under the action of the tighten-down screw (67).

25. An improved head according to Claim 24 above, characterized in that the wedge contact is advantageously achieved by provision of a conical surface taper (68).

26. An improved head according to either Claim 24 or 25, characterized in that the radial gripping movement of the jaws is guided by a prismatic fit (95, 96) to the clamp housing (94) or cover (93).

27. An improved head according to one of Claims 24 to 26, characterized in that an elastic means (97) is mounted between the two jaws to open them when the clamping action is released.

28. An improved head according to one of Claims 24 to 27, characterized in that the shaft-gripping surfaces (100) are semicircular about a center that is offset from the shaft centerline in a direction toward the opposite jaw.

29. An improved clamp (10) for locking the rotary pump driveshaft (8) in crude oil wells, comprising jaws adapted to be closed around the driveshaft by means of screws, characterized in that said jaws are paired (35, 36), one (35) pulls and one (36) pushes, for operation by means of a screw (38) acting with its end on one jaw (35) and engaged in a threaded hole formed in the other jaw (36).

30. A clamp according to Claim 29 above, characterized in that it

comprises a jaw pair (35, 36), one (35) pulls and one (36) pushes, for operation by means of a screw (38) acting with its end on the push jaw and engaged in a threaded hole formed in the pull jaw.

31. A clamp according to either Claim 29 or 30, characterized in that the stem of the screw is cylindrical and fits through a seal on the cover.

32. A clamp, according to claims 29, 30 and 31 above, characterized in that between the pull jaws and the cover there are guide and elastic-reaction parts.

33. An improved clamp (65) for locking the rotary pump driveshaft (8) in crude oil wells, comprising jaws adapted to be closed around the driveshaft by means of a screw, characterized in that the self-centering jaws (66) are operated to close by a wedge contact (68) relationship established between the outer surfaces of the jaws and the inner surface of the sliding body (69) of the clamp under the action of the tighten-down screw (67).

34. A clamp according to Claim 33 above, characterized in that the wedge contact is advantageously achieved by provision of a conical surface taper (68).

35. A clamp according to either Claim 33 or 34, characterized in that the radial gripping movement of the jaws is guided by a prismatic fit (95, 96) to the clamp housing (94) or cover (93).

36. A clamp according to one of Claim 33 to 35, characterized in that an elastic means (97) is mounted between the two jaws to open them when the clamping action is released.

37. A clamp according to one of Claim 33 to 36, characterized in that the shaft-gripping surfaces (100) are semicircular about a center that is offset from the shaft centerline in a direction toward the opposite jaw.